

Vegetation with Isoetes in the Iberian Peninsula

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Three soft-water communities, each characterized by a perennial aquatic *Isoetes* species (*I. lacustris*, *I. echinospora* and *I. velata* s.l., respectively), are recognized in **Spanish high-mountain lakes** [1]. Among them, the western group contains taxa of an infraspecific rank (*Isoetes velata* subsp. *asturicense*, *Isoetes velata* subsp. *velata* f. *lereschii*, *Antinoria agrostidea* subsp. *natans*) that are closely related to more widespread lowland taxa (*Isoetes velatum* subsp. *velatum* f. *velatum*, *Antinoria agrostidea* subsp. *agrostidea*).

The ephemeral quillwort swards are related to **Mediterranean temporary ponds** [2,3]. Five groups characterized by ephemeral terrestrial *Isoetes* species: *I. hystrix*, *I. setacea*, *Isoetes velata* subsp. *velata* and *I. durieui* are recognized on the Iberian Peninsula [3,4]. The spatial distribution of *Isoetes* has been studied in a Mediterranean vernal pool system where three species (*I. velata*, *I. setacea* and *I. hystrix*) were found in overlapping bands related to the period of flooding [5]. The intermediate belt included an interesting phytogeographical element in *Ranunculus longipes* and *Isoetes setacea*.

The **Strait of Gibraltar** acts as a biogeographical barrier for communities characterized by *Isoetes velata* s.l., where a vicariance can be seen between *Isoetes velata* subsp. *velata* and *Isoetes velata* subsp. *adspersa* on both sides of the Strait [6].

[1] Molina J.A., Sardinero S. & Pertíñez C. Soft-water vegetation (Littorellion) in Spanish mountains. 1999. Folia Geobotanica 34: 253-260.

[2] Pinto-Cruz C., Molina J.A., Barbour M., Silva V. & M.D. 2009. Espírito-Santo. Plant communities as a tool in temporary ponds conservation in SW Portugal. Hydrobiologia 634: 11-24.

[3] Silva V., Molina J.A., Costa J.C. 2009. Nova associacao de charcos temporários mediterrânicos do SW da Península Ibérica: Eryngio corniculati-Isoetetum setacei. Acta Botanica Malacitana 34: 236-242.

[4] Molina J.A. The vegetation of temporary ponds with *Isoetes* in the Iberian Peninsula. 2005. Phytocoenologia 35(2-3): 219-230.

[5] Molina J.A., Lumbreras A., Gallardo T., Agostinelli E., Casermeiro M.A. & Prada C. 2011. Small-scale *Isoetes* distribution pattern in a Mediterranean vernal pool system. Acta Botanica Gallica 158(1): 27-36.

[6] Lumbreras A., Tahiri H., Pinto-Cruz C., Pardo C. & Molina J.A. 2012. Habitat variation in vernal pool ecosystems on both sides of the Strait of Gibraltar. Journal of Coastal Research 28 (5): 1032-1039.